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Something is 'subsiding' in the state of Denmark
operational prospects for nationwide subsidence mapping with Sentinel-1

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Motivation

Why?

...to assess the potential and applicability of Copernicus Sentinel-1 for nationwide deformation mapping applications.

...what is the optimal (Sentinel-1 InSAR) deformation product from the end user perspective?

...free and open access to Copernicus data has a potential value to many end users, however, extraction of information from data is challenging.

What?

...a number of case studies in Denmark, and in long term the whole country.

...current focus on three urban areas with different subsidence phenomena.

Processing & Analysis Methodology

How?

...routine InSAR processing of Sentinel-1 data and low resolution nationwide coherence analysis to assess the potential.

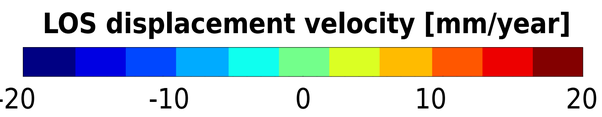
...time series analysis performed with the classical PSI ('vanilla') algorithms optimized for Sentinel-1 TOPS mode.

Data overview

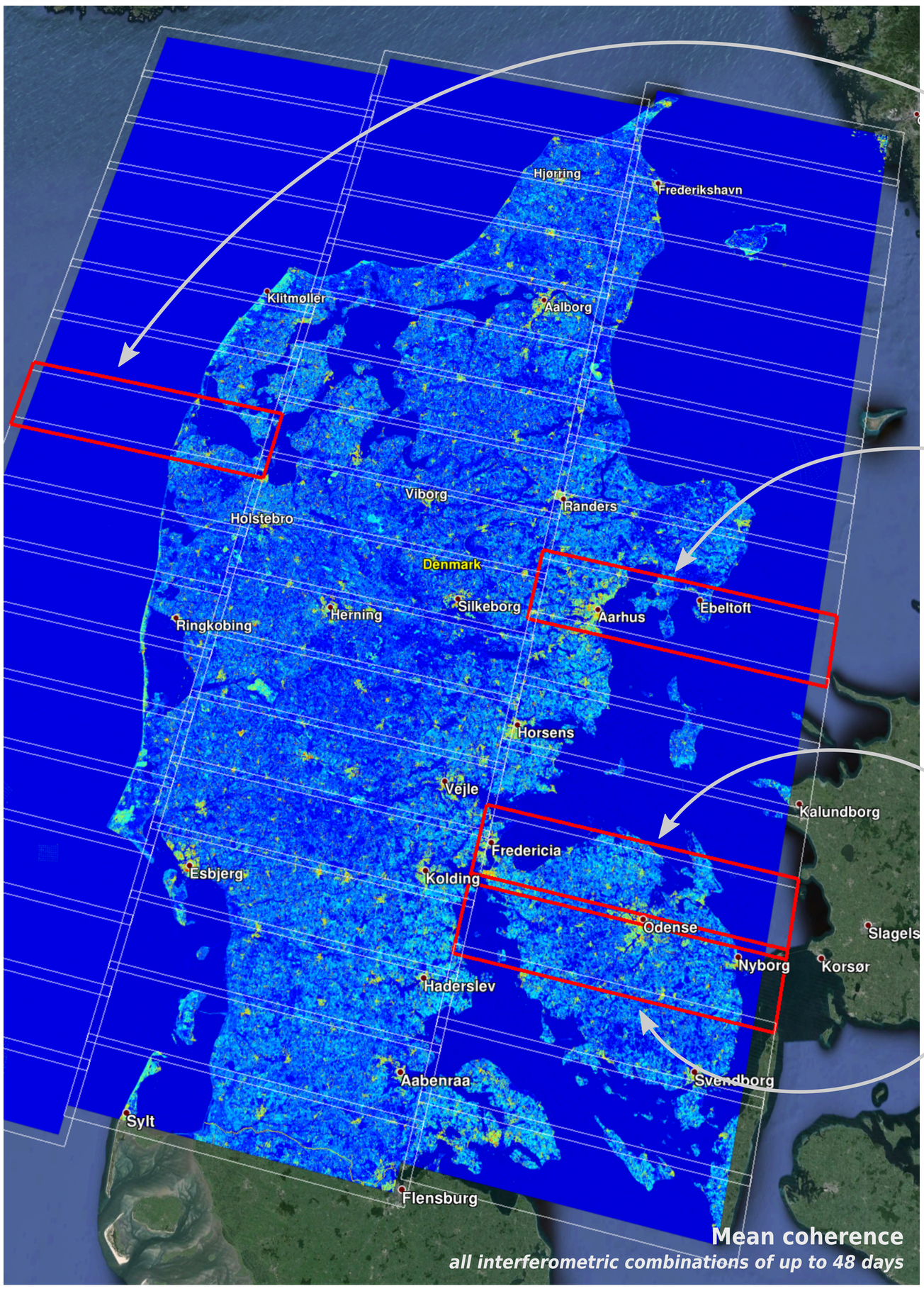
...all available data from descending track 139D:

...observation window of 1 year (March 2015 - March 2016),

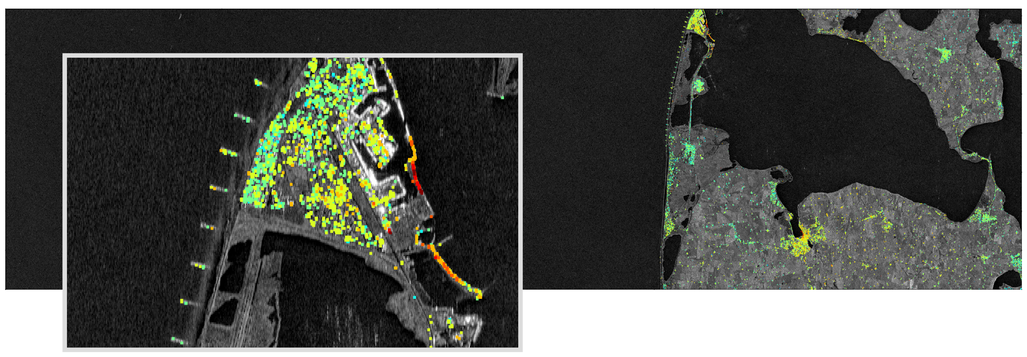
...in total 27 scenes x 3 slices utilized.



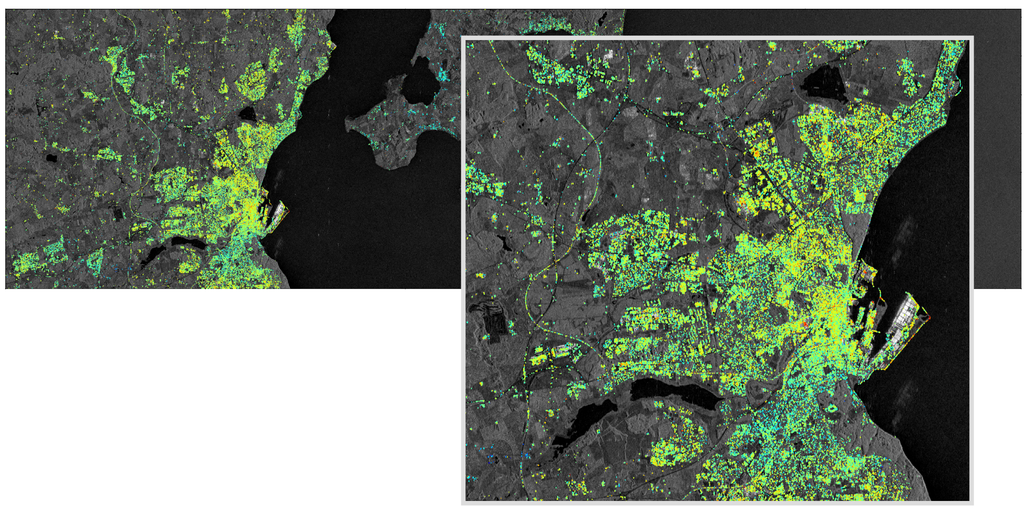
Results overview



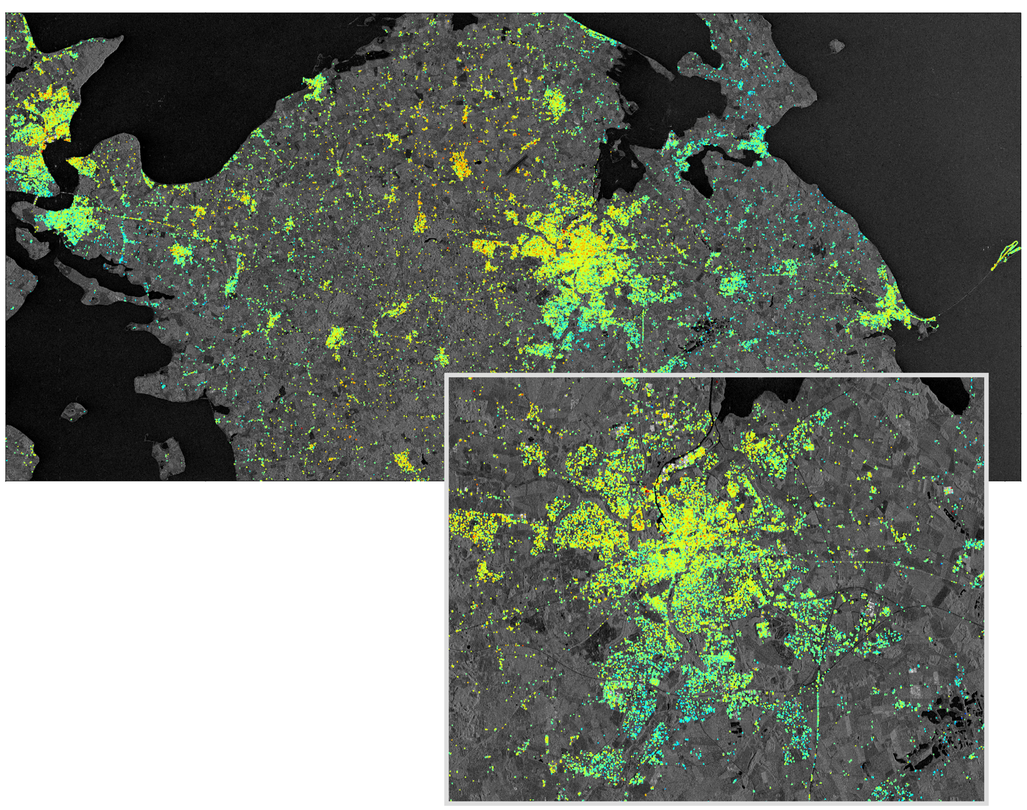
Thyborøn



Aarhus



Odense



Outlook & Open Challenges

Technical challenges

...how to integrate algorithmic state-of-the-art in a single processing system?

...how to operationally deploy the re-defined state-of-the-art?

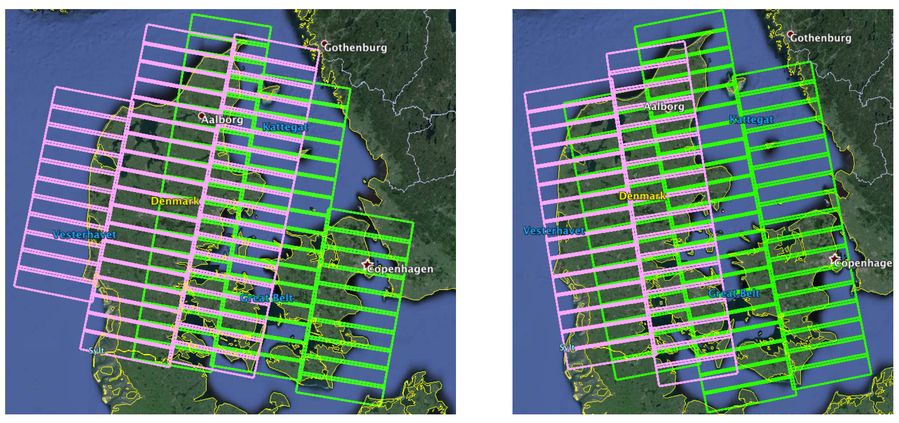
...how to optimally perform "coherence mining" through the large graph of Sentinel-1 data?

Results dissemination challenges

...what are the specific types of products needed by the end user community?

...how to communicate results to non-InSAR communities?

We are happy to discuss and share our initial experiences on all of these questions!



Full coverage of Denmark by Sentinel-1

Descending tracks: 66 and 139

Ascending tracks: 44 and 117

Acknowledgment: ***All results contain modified Copernicus data (2015-2016)***

PPO.Labs

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